

wherein a clearance is formed between said stator and said casing portion, so that, when an abnormal torque is applied from said rotor to said stator, at least a part of said stator is allowed to move radially into said clearance.

39. (New) A turbo-molecular pump according to claim 38, further comprising a slide facilitating member for facilitating said stator to slide in a circumferential direction relative to said casing portion.

40. (New) A turbo-molecular pump according to claim 39, wherein said slide facilitating member is a low friction member provided between said stator and said casing portion.

41. (New) A turbo-molecular pump according to claim 39, wherein said slide facilitating member is a support structure for rotatably supporting said stator.

42. (New) A turbo-molecular pump according to claim 38, wherein an impact absorbing member is provided between said stator and said casing portion.

43. (New) A turbo-molecular pump according to claim 38, wherein said stator has an impact absorbing structure.

44. (New) A turbo-molecular pump according to claim 42, wherein said impact absorbing structure comprises an inner casing surrounding a vane pumping section and/or a groove pumping section comprised by said stator and said rotor.

45. (New) A turbo-molecular pump according to claim 42, wherein said impact absorbing structure comprises a friction reducing mechanism provided between said inner casing, and said stator or said casing portion.

46. (New) A turbo-molecular pump according to claim 43, wherein said impact absorbing structure comprises an impact absorbing member provided between said inner casing, and said stator or said casing portion.

47. (New) A turbo-molecular pump according to claim 38, further comprising an inner casing which surrounds said stator.

48. (New) A turbo-molecular pump according to claim 47, wherein a friction reducing mechanism is provided between said inner casing, and said stator or said casing portion.

49. (New) A turbo-molecular pump according to claim 38, further comprising a temperature adjusting mechanism for directly or indirectly heating or cooling said stator.

50. (New) A turbo-molecular pump according to claim 49, wherein an inner casing surrounds said stator, and said temperature adjusting mechanism is provided on said inner casing.

51. (New) A turbo-molecular pump according to claim 38, further comprising:  
a sealing portion provided between a portion of said stator which is caused to be rotated with rotating element by said abnormal torque, and a portion which is not rotated with rotating element

by said abnormal torque and is stationary.

52. (New) A turbo-molecular pump according to claim 38, wherein an inner casing surrounds said stator, and said clearance is provided between said inner casing and said casing portion.

53. (New) A turbo-molecular pump according to claim 52, wherein said inner casing is fixed by fitting a part of an inner surface or an outer surface of said inner casing to a cylindrical portion of said stator or to said casing portion.

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~~54. (New) A turbo-molecular pump according to claim 52, wherein said inner casing and/or said casing portion is comprised by a high thermal conductivity material.~~

55. (New) A turbo-molecular pump according to claim 38, wherein said vane and/or said groove pumping section stator is attached to said casing portion by way of a friction reducing mechanism.

56. (New) A turbo-molecular pump according to claim 38, wherein said vane pumping section is comprised by said stator and said rotor, and a temperature adjusting mechanism is provided between a downstream side of said vane pumping section and an upstream side of an exhaust port of said turbo-molecular pump.

57. (New) A turbo-molecular pump according to claim 38, wherein a sealing portion is provided between said stator of said vane pumping section and said casing portion.

58. (New) A turbo-molecular pump according to claim 38, wherein a sealing portion is provided between said stator of said groove pumping section and said casing portion.

59. (New) A turbo-molecular pump comprising:

a rotor;

a stator surrounding said rotor;

a casing portion housing said stator and said rotor therein; and

a vane pumping section and/or a groove pumping section comprised by said stator and said rotor;

wherein a clearance is formed between said stator and said casing portion, so that, when an abnormal torque is applied from said rotor to said stator, at least a part of said stator is allowed to rotate.

60. (New) A turbo-molecular pump according to claim 59, further comprising a slide facilitating member for facilitating said stator to slide in a circumferential direction relative to said casing portion.

61. (New) A turbo-molecular pump according to claim 60, wherein said slide facilitating member is a low friction member provided between said stator and said casing portion.

62. (New) A turbo-molecular pump according to claim 60, wherein said slide facilitating member is a support structure for rotatably supporting said stator.

63. (New) A turbo-molecular pump according to claim 59, wherein an impact absorbing member is provided between said stator and said casing portion.

64. (New) A turbo-molecular pump according to claim 59, wherein said stator has an impact absorbing structure.

65. (New) A turbo-molecular pump according to claim 63, wherein said impact absorbing structure comprises an inner casing surrounding a vane pumping section and/or a groove pumping section comprised by said stator and said rotor.

66. (New) A turbo-molecular pump according to claim 63, wherein said impact absorbing structure comprises a friction reducing mechanism provided between said inner casing, and said stator or said casing portion.

67. (New) A turbo-molecular pump according to claim 64, wherein said impact absorbing structure comprises an impact absorbing member provided between said inner casing, and said stator or said casing portion.

68. (New) A turbo-molecular pump according to claim 59, further comprising an inner casing which surrounds said stator.

69. (New) A turbo-molecular pump according to claim 68, wherein a friction reducing mechanism is provided between said inner casing, and said stator or said casing portion.

70. (New) A turbo-molecular pump according to claim 59, further comprising a temperature adjusting mechanism for directly or indirectly heating or cooling said stator.

71. (New) A turbo-molecular pump according to claim 70, wherein an inner casing surrounds said stator, and said temperature adjusting mechanism is provided on said inner casing.

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~~72. (New) A turbo-molecular pump according to claim 59, further comprising:  
a sealing portion provided between a portion of said stator which is caused to be rotated with rotating element by said abnormal torque, and a portion which is not rotated with rotating element by said abnormal torque and is stationary.~~

73. (New) A turbo-molecular pump according to claim 59, wherein an inner casing surrounds said stator, and said clearance is provided between said inner casing and said casing portion.

74. (New) A turbo-molecular pump according to claim 73, wherein said inner casing is fixed by fitting a part of an inner surface or an outer surface of said inner casing to a cylindrical portion of said stator or to said casing portion.

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~~75. (New) A turbo-molecular pump according to claim 73, wherein said inner casing and/or said casing portion is comprised by a high thermal conductivity material.~~

76. (New) A turbo-molecular pump according to claim 59, wherein said vane and/or said groove pumping section stator is attached to said casing portion by way of a friction reducing

mechanism.

77. (New) A turbo-molecular pump according to claim 59, wherein said vane pumping section is comprised by said stator and said rotor, and a temperature adjusting mechanism is provided between a downstream side of said vane pumping section and an upstream side of an exhaust port of said turbo-molecular pump.

78. (New) A turbo-molecular pump according to claim 59, wherein a sealing portion is provided between said stator of said vane pumping section and said casing portion.

79. (New) A turbo-molecular pump according to claim 59, wherein a sealing portion is provided between said stator of said groove pumping section and said casing portion.

80. (New) A turbo-molecular pump comprising:

a casing portion housing a stator and a rotor therein;

a vane pumping section and/or a groove pumping section comprised by said stator and said

rotor;

an inner casing surrounding said vane pumping section and/or said groove pumping section;

and

a temperature adjusting mechanism provided on said inner casing.

81. (New) A turbo-molecular pump comprising:

a casing portion housing a stator and a rotor therein, said stator surrounding said rotor;


a vane pumping section and/or a groove pumping section comprised by said stator and said rotor;

an inner casing portion surrounding said stator;

a clearance provided between said inner casing portion and said casing portion; and

a sealing portion provided between a portion of said inner casing portion or said stator which is caused to be rotated with rotating element by an abnormal torque which is applied from said rotor to said stator, and said casing portion which is not rotated with rotating element by said abnormal torque and is stationary.

82. (New) A turbo-molecular pump according to claim 81, wherein said sealing portion is pressed in an axial direction of a main shaft.

 ~~83. (New) A turbo-molecular pump comprising:~~

~~a casing portion housing a stator and a rotor therein, said stator surrounding said rotor;~~

~~a vane pumping section and/or a groove pumping section comprised by said stator and said rotor; and~~

~~a sealing portion provided between a portion of said stator which is caused to be rotated with rotating element by an abnormal torque which is applied from said rotor to said stator, and a portion which is not rotated with rotating element by said abnormal torque and is stationary.~~

84. (New) A turbo-molecular pump according to claim 83, wherein said sealing portion is pressed in an axial direction of a main shaft.



- ~~85. (New) A turbo-molecular pump comprising:~~  
~~a casing portion housing a stator and a rotor therein;~~  
~~a vane pumping section and/or a groove pumping section comprised by said stator and said rotor; and~~  
~~a heating source provided at a lower portion of said stator of said groove pumping section.~~
86. (New) A turbo-molecular pump according to claim 85, wherein said heating source is in a vacuum condition.

87. (New) A turbo-molecular pump comprising:  
a casing portion housing a stator and a rotor therein;  
a vane pumping section and/or a groove pumping section comprised by said stator and said rotor; and  
a heating source provided at a lower end portion of said stator of said groove pumping section.

88. (New) A turbo-molecular pump comprising:  
a casing portion housing a stator and a rotor therein;  
a vane pumping section and a groove pumping section comprised by said stator and said rotor; and  
a cooling device provided between a downstream side of said vane pumping section and an upstream side of said groove pumping section.

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~~89. (New) A turbo-molecular pump according to claim 88, wherein another cooling device is provided at the bottom portion of said stator.~~

90. (New) A turbo-molecular pump comprising:  
a casing portion housing a stator and a rotor therein;  
a vane pumping section and a groove pumping section comprised by said stator and said rotor; and  
a cooling device provided on said casing portion at a position corresponding to said groove pumping section.

91. (New) A turbo-molecular pump according to claim 90, wherein said cooling device cools said stator and/or rotor of said vane pumping section.

92. (New) A turbo-molecular pump according to claim 90, wherein a heat transfer path is provided between said cooling device and said stator of said vane pumping section.

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~~93. (New) A turbo-molecular pump according to claim 90, wherein another cooling device is provided at the bottom portion of said stator.~~

94. (New) A turbo-molecular pump comprising:  
a casing portion housing a stator and a rotor therein;  
a vane pumping section and a groove pumping section comprised by said stator and said rotor;

a heating source provided at a lower portion of said stator of said groove pumping section;  
and  
a cooling device provided between a downstream side of said vane pumping section and an upstream side of said groove pumping section.

95. (New) A turbo-molecular pump according to claim 94, further comprising an inner casing surrounding said stator and/or said rotor of said vane pumping section and/or said groove pumping section.

96. (New) A turbo-molecular pump according to claim 95, wherein a heat transfer path is provided between said inner casing and said casing portion.

97. (New) A turbo-molecular pump according to claim 95, wherein a heat transfer path is provided between said inner casing and a stator vane spacer.

98. (New) A turbo-molecular pump comprising:  
a casing portion housing a stator and a rotor therein; and  
a vane pumping section and/or a groove pumping section comprised by said stator and said rotor;  
wherein said stator of said vane pumping section and/or said groove pumping section is rotatably provided with respect to said casing portion; and  
an impact absorbing structure is provided at a position close to an inlet of said casing portion.

99. (New) A turbo-molecular pump according to claim 98, wherein said impact absorbing structure comprises a ring body, an attachment ring, and a plurality of stay members for coupling said ring body and said attachment ring concentrically.--.

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